EXHIBIT J

TO THE DECLARATION OF ARPITA BHATTACHARYYA IN SUPPORT OF ASETEK DANMARK A/S'S MOTION FOR PARTIAL SUMMARY JUDGMENT

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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NOTICE OF ALLOWANCE AND FEE(S) DUE

22874 7590 04/30/2015

GANZ POLLARD, LLC
P O BOX 2200
HILLSBORO, OR 97123

EXAMINER
ROJOHN III, CLAIRE E

ART UNIT	PAPER NUMBER
3744	

DATE MAILED: 04/30/2015

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/183,443	02/18/2014	Geoff Sean Lyon	COOL-2.018.US	3601

TITLE OF INVENTION: FLUID HEAT EXCHANGE SYSTEMS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	07/30/2015

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

22874 7590 04/30/2015
GANZ POLLARD, LLC
P O BOX 2200
HILLSBORO, OR 97123

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/183,443	02/18/2014	Geoff Sean Lyon	COOL-2.018.US	3601

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nonprovisional	SMALL	$480	$0	$0	$480	07/30/2015

EXAMINER	ART UNIT	CLASS-SUBCLASS
ROJOHN III, CLAIRE E	3744	165-104310

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29
  NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27
  NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status.
  NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

UNITED STATES PATENT AND TRADEMARK OFFICE

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ROJOHN III, CLAIRE E	

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3744	

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Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 14/183,443	Applicant(s) LYON, GEOFF SEAN	
	Examiner CLAIRE ROJOHN III	Art Unit 3744	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *amendment filed 1/30/2015*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *49,51-57,59-66,68-73 and 75-82*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 2/20/2015, 2/5/2015
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☒ Interview Summary (PTO-413), Paper No./Mail Date *20150318* .
5. ☒ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☒ Other *Replacement drawings labeled Replacement_dwgs*.

/C. R./
Examiner, Art Unit 3744

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

2. This action is in response to amendment filed 1/30/2015. Currently, claims 1-48, 67 and 74 of the claims have been canceled, claims 78-80 have been added, claims 49-66, 68-73 and 75-80 are pending and claims 53, 57, 62-66, 68-70, 75-76 are withdrawn.

Drawings

3. Applicant's arguments, see page 11, filed 1/30/2015, with respect to the newly submitted drawings have been fully considered and are persuasive. The drawing objection has been withdrawn.

4. Applicant faxed corrected drawings to the examiner. These drawings are acceptable and are entered below by Examiner's amendment.

Claim Rejections - 35 USC § 112

5. Applicant's arguments, see page 11, filed 1/30/2015, with respect to claims 75-77 have been fully considered and are persuasive. The 112 rejection of claims 75-77 has been withdrawn.

EXAMINER'S AMENDMENT

6. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided

by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Lloyd Pollard, Reg. #: 64,793 on 3/26/2015.

The application has been amended as follows:

Replace claim 49 in its entirety with - - A heat exchange system comprising:

a heat sink having a plurality of juxtaposed fins defining a corresponding plurality of microchannels between adjacent fins, wherein the heat sink defines a recessed groove extending transversely relative to the fins;

a housing member defining a first side and a second side, wherein the second side defines a recessed region;

a compliant member matingly engaged with the second side of the housing member, wherein the compliant member at least partially defines an opening positioned over the groove, wherein the compliant member and the groove together define a portion of an inlet manifold configured to hydraulically couple in parallel each of the microchannels to at least one other of the microchannels, and wherein the housing member further defines a portion of an inlet plenum,

wherein the inlet plenum and the inlet manifold are together configured to convey a fluid in a direction generally transverse to the fins and thereby to distribute the fluid among the plurality of microchannels and to convey the fluid into the plurality of microchannels in a direction generally parallel to the fins,

wherein a portion of the compliant member occupies a portion of the recessed region defined by the second side of the housing member and urges against a corresponding wall of the recessed region while leaving a portion of the recessed region defined by the second side of the housing member unoccupied to define first and second exhaust manifold regions positioned opposite to each other relative to the recessed groove and opening from end regions of the microchannels. - -

Replace claims 50 and 58 in its entirety with - - (Canceled) - -

Replace claim 59 in its entirety with - - The heat exchange system of claim 49, wherein the portion of the inlet plenum is recessed from the second side of the housing member, wherein the first side of the housing member is positioned opposite the second side, and a recess from the first side defines a pump volute, wherein the portion of the inlet plenum is positioned adjacent the pump volute. - -

Replace claim 69 in its entirety with - - The heat exchange system of claim 62, wherein the housing member defines a portion of an inlet plenum being recessed from the second side and a portion of an inlet manifold being recessed from the second side, wherein the housing member further defines a pump volute recessed from the first side, wherein the portion of the inlet plenum is positioned adjacent the pump volute. - -

Replace claim 70 in its entirety with - - The heat exchange system of claim 69, wherein the recess defining the pump volute is a substantially cylindrically-shaped recess having a longitudinal axis extending substantially perpendicularly to the first side, and wherein the housing member defines an opening extending generally tangentially of the cylindrically-shaped recess. - -

Replace claim 80 in its entirety with - - A heat exchange system comprising:

a heat sink having a heat spreader and a plurality of juxtaposed fins extending therefrom to define a corresponding plurality of microchannels, wherein a distal edge of each fin spaced apart from the heat spreader defines a recess such that the plurality of fins defines a transverse groove;

a housing member defining a first side and a second side, and an inlet passage, wherein the second side defines a recessed region partially defining an inlet plenum;

a compliant member sealingly engaged with the second side of the housing member, wherein the compliant member at least partially defines an opening positioned over the groove and in alignment with the inlet plenum, wherein the compliant member defines an elongate recess positioned over and extending coextensively with the transverse groove to at least partially define an inlet manifold opening to each of the microchannels, wherein the compliant member urges against the housing such that a flow of fluid from the inlet passage of the housing and into the inlet plenum passes through the inlet manifold in a direction generally transverse to the plurality of juxtaposed fins and into the plurality of microchannels in a direction substantially parallel to the corresponding fins, wherein a portion of the compliant member occupies a portion of the recessed region defined by the second side of the housing member while leaving a portion of the recessed region defined by the second side of the housing member unoccupied to define opposed exhaust manifold regions relative to the recessed groove and opening from end regions of the microchannels. - -

Add claim 81 - - (New) The heat exchange system of claim 80, wherein each of the fins in the plurality of fins defines a corresponding beveled distal edge. - -

Add claim 82 - - (New) The heat exchange system of claim 80, wherein the housing member further defines a substantially cylindrically-shaped recess from the first side defining a pump volute and an opening extending generally tangentially of the cylindrically-shaped recess, wherein a portion of the recess from the second side at least partially defining the inlet plenum is positioned radially outward of the substantially cylindrically-shaped recess defined by the first side. - -

The attached drawings are hereby entered.

Election/Restrictions

7. Claim 49 is allowable. The restriction requirement between inventions I-IV and Species A-C, as set forth in the Office action mailed on 5/22/2014 , has been reconsidered in view of the allowability of claims to the elected invention pursuant to MPEP § 821.04(a). **The restriction requirement is hereby withdrawn as to any claim that requires all the limitations of an allowable claim.** Specifically, the restriction requirement of inventions A-C, sub-species CA-CD and sub-species CBA-CBB is withdrawn. Claims 53, 57, 62-66, 68-70, 75-76, directed towards different species are no longer withdrawn from consideration because the claim(s) requires all the limitations of an allowable claim.

In view of the above noted withdrawal of the restriction requirement, applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

Once a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See In re Ziegler, 443 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

Allowable Subject Matter

8. Claims 49, 51-57, 59-66, 68-73, 75-82 are allowed.

The following is an examiner's statement of reasons for allowance: The prior art does not anticipate nor render obvious the combination set forth in the independent claims, and specifically does not show "a heat sink… wherein the heat sink defines a recessed groove… a compliant member matingly engaged with the second side of the housing member, wherein the compliant member at least partially defines an opening positioned over the groove, wherein the compliant member and the groove together define a portion of an inlet manifold configured to hydraulically couple in parallel each of the microchannels to at least one other of the microchannels, and wherein the housing member further defines a portion of an inlet plenum, wherein the inlet plenum and the inlet manifold are together configured to convey a fluid in a direction generally transverse to the fins and thereby to distribute the fluid among the plurality of microchannels and to convey the fluid into the plurality of microchannels in a direction generally parallel to the fins." The closest prior art of record Nelson US Patent No.: 4,909,315 discloses a heat sink with fins that have a groove and a cover above the fins, but not a cover that is a compliant member that has an opening positioned over every fin and distribute fluid transverse to the fins and then parallel to the fins as claimed. Although it is well known to provide a heat sink within a housing for a pump, there is no

teaching in the prior art of record that would, reasonably and absent impermissible hindsight, motivate one having ordinary skill in the art to modify the teachings of the prior art to incorporate a compliant member aligned above a heat sink with grooves to distribute fluid in the manner as claimed. Thus, for at least the foregoing reasons, the prior art of record neither anticipates nor rendered obvious the present invention as set forth in claims 49 and 80.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CLAIRE ROJOHN III whose telephone number is (571)270-5431. The examiner can normally be reached on 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Judy Swann can be reached on (571) 272-7075. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. R./ Examiner, Art Unit 3744	/ALLEN FLANIGAN/ Primary Examiner, Art Unit 3744 (571) 272-4910

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Geoff Sean LYON

Confirmation No. 3601

Serial No. 14/183,443

Attorney Docket No.: COOL-2.018.US

Filed: February 18, 2014

Art Unit: 3744

For: FLUID HEAT EXCHANGE SYSTEMS

Examiner: Claire E. Rojohn III

FILED VIA EFS ON JANUARY 30, 2015

AMENDMENT AND RESPONSE TO OFFICE ACTION DATED OCTOBER 30, 2014

The Office Action dated October 30, 2014, set a three-month period for responding, making a reply due by January 30, 2015. Please amend the above-identified application as follows.

Amendments to the Claims are reflected in the listing of claims beginning on page 2.

Amendments to the Drawings begin on page 10, and include the attached replacement sheet.

Remarks begin on page 11.

Amendments to the Claims

This listing of claims replaces all prior versions and listing of claims in the application.

Listing of Claims

1. – 48. (Cancelled)

49. (Currently Amended) A heat exchange system comprising:

a heat sink having a plurality of juxtaposed fins defining a corresponding plurality of microchannels between adjacent fins, wherein the heat sink defines a recessed groove extending transversely relative to the fins;

a housing member defining a first side and a second side, wherein the second side defines a recessed region;

a compliant member matingly engaged with the ~~first~~ second side of the housing member, wherein the compliant member at least partially defines an opening positioned over the groove, wherein a portion of the compliant member occupies a portion of the recessed region defined by the second side of the housing member and urges against a corresponding wall of the recessed region while leaving a portion of the recessed region defined by the second side of the housing member unoccupied to define exhaust manifold regions flanking the recessed groove and opening from end regions of the microchannels.

50. (Previously Presented) The heat exchange system of claim 49, wherein the compliant member and the groove together define a portion of an inlet manifold configured to hydraulically couple in parallel each of the microchannels to at least one other of the microchannels.

51. (Previously Presented) The heat exchange system of claim 49, wherein the heat sink comprises a heat spreader, each of the fins extends from the heat spreader and defines a corresponding distal edge spaced from the heat spreader, and the groove is recessed from the respective plurality of distal edges.

52. (Previously Presented) The heat exchange system of claim 51, wherein each of the respective distal edges defines a corresponding recessed portion, thereby defining the recessed groove.

53. (Withdrawn) The heat exchange system of claim 49, wherein a cross-sectional profile of the recessed groove comprises a selected one or more of the group consisting of a v-shaped notch, a semi-circle, a parabola, a hyperbola, and a notch having at least one substantially straight edge.

54. (Previously Presented) The heat exchange system of claim 49, wherein the opening in the compliant member has a recessed region and an aperture extending from the recessed region through the compliant member.

55. (Previously Presented) The heat exchange system of claim 54, wherein the recessed region in the compliant member is a tapered recessed region having at least one cross-sectional dimension that diminishes with increasing depth of the recessed region.

56. (Previously Presented) The heat exchange system of claim 50, wherein the inlet manifold is configured to deliver a flow of a fluid to each of the microchannels in an orthogonal direction relative to a longitudinal axis of the respective microchannels.

57. (Withdrawn) The heat exchange system of claim 49, wherein each of the fins in the plurality of fins defines a corresponding beveled distal edge.

58. (Previously Presented) The heat exchange system of claim 50, wherein the housing member further defines a portion of an inlet plenum, wherein the inlet plenum and the inlet manifold are together configured to convey a fluid in a direction generally transverse to the fins and thereby to distribute the fluid among the plurality of microchannels.

59. (Currently Amended) The heat exchange system of claim 58, wherein the portion of the inlet plenum is recessed from the ~~first~~ second side of the housing member, wherein the ~~second~~ first side of the housing member is positioned opposite the ~~first~~ second side, and a recess from the ~~second~~ first side defines a pump volute, wherein the portion of the inlet plenum is positioned adjacent the pump volute.

60. (Currently Amended) The heat exchange system of claim 59, wherein the recess defining the pump volute has a substantially cylindrically-shaped portion having a longitudinal axis extending substantially perpendicularly to the ~~second~~ first side, and wherein the housing member defines an opening from the substantially cylindrically-shaped portion extending generally tangentially of the cylindrically-shaped portion.

61. (Previously Presented) The heat exchange system of claim 59, wherein the housing member defines a second recessed region positioned laterally outward of the portion of the inlet plenum, and a wall at least partially separating the second recessed region from the inlet manifold, wherein a portion of the second recessed region at least partially

defines an exhaust manifold overlying a respective portion of each of the microchannels at a position spaced from the inlet manifold.

62. (Withdrawn) A heat exchange system according to claim 49,

wherein each of the fins defines a respective beveled distal edge, and wherein

the compliant member overlies at least a portion of each of the beveled distal edges and the opening is configured to convey a fluid to the microchannels in a direction transverse to the microchannels.

63. (Withdrawn) The heat exchange system of claim 62, wherein the heat sink comprises a heat spreader, each of the fins extends from the heat spreader and each corresponding beveled distal edge is spaced from the heat spreader.

64. (Withdrawn) The heat exchange system of claim 63, wherein a distance between a respective beveled distal edge and the heat spreader defines a height of the respective fin, wherein each respective fin defines a first end and a second end and extends longitudinally in a spanwise direction relative to the heat spreader between the first end and the second end, wherein the fin height of one or more of the plurality of fins varies along the spanwise direction.

65. (Withdrawn) The heat exchange system of claim 64, wherein the compliant member comprises a compliant portion urging against at least a portion of each of the distal edges.

66. (Withdrawn) The heat exchange system of claim 65, wherein the variation in fin height along the spanwise direction defines a non-linear contour of the respective distal edge, wherein the portion of the compliant member substantially conforms to the non-linear contour.

67. (Cancelled)

68. (Withdrawn) The heat exchange system of claim 62, wherein each of the beveled distal edges defines a corresponding recessed portion, thereby defining the recessed groove.

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69. (Withdrawn) The heat exchange system of claim 62, wherein the housing member defines a portion of an inlet plenum being recessed from the first side and a portion of an inlet manifold being recessed from the first side, wherein the housing member further defines a pump volute recessed from the second side, wherein the portion of the inlet plenum is positioned adjacent the pump volute.

70. (Withdrawn) The heat exchange system of claim 69, wherein the recess defining the pump volute is a substantially cylindrically-shaped recess having a longitudinal axis extending substantially perpendicularly to the second side, and wherein the housing member defines an opening extending generally tangentially of the cylindrically-shaped recess.

71. (Currently Amended) The heat exchange system of claim 49, wherein the housing member defines a substantially continuous perimeter wall extending between the first side and the second side, and a floor substantially separating the first side from the

second side, wherein the ~~second~~ first side defines a substantially cylindrically-shaped recess having an opening positioned tangentially thereto and the ~~first~~ second side defines a recessed inlet plenum positioned radially outward of the substantially cylindrically-shaped recess defined by the first side, wherein the housing member further defines an aperture opening to the inlet plenum.

72. (Currently Amended) The heat exchange system ~~of claim~~ of claim 71, wherein the inlet plenum is in fluid communication through the compliant member with the groove.

73. (Previously Presented) The heat exchange system of claim 71 , wherein the substantially cylindrically-shaped recess comprises a pump volute.

74. (Cancelled)

75. (Withdrawn – Currently Amended) ~~A fluid~~The heat ~~exchanger according to~~exchange system of claim 49 wherein the recessed groove is positioned in the middle 50% of a length measured between opposed ends of the microchannels.

76. (Withdrawn – Currently Amended) ~~A fluid~~The heat ~~exchanger according to~~exchange system of claim 49 wherein the ~~elongate fluid inlet~~ opening positioned over the groove is positioned in the middle 20% of a length measured between the opposed ends of the microchannels.

77. (Currently Amended) ~~A fluid~~The heat ~~exchanger according to~~exchange system of claim 49, wherein the housing has an inlet passage and an outlet passage, and the compliant member comprises a seal urging against the housing such that a flow of fluid from the inlet passage of the housing must pass through the opening defined by the compliant member and into the plurality of juxtaposed microchannels before the flow of the fluid passes through the outlet passage of the housing.

78. (New) The heat exchange system of claim 49, wherein the compliant member defines a recessed region substantially coextensive with the recessed groove extending transversely relative to the fins.

79. (New) The heat exchange system of claim 54, wherein the compliant member defines a recessed region substantially coextensive with the recessed groove extending transversely relative to the fins.

80. (New) A heat exchange system comprising:

a heat sink having a heat spreader and a plurality of juxtaposed fins extending therefrom to define a corresponding plurality of microchannels, wherein a distal edge of each fin spaced apart from the heat spreader defines a recess such that the plurality of fins defines a transverse groove;

a housing member defining a first side and a second side, and an inlet passage, wherein the second side defines a recessed region partially defining an inlet plenum and the inlet passage opens to the inlet plenum;

a compliant member sealingly engaged with the second side of the housing member, wherein the compliant member at least partially defines an opening positioned over the groove and in alignment with the inlet plenum, wherein the compliant

member defines an elongate recess positioned over and extending coextensively with the transverse groove to at least partially define an inlet manifold opening to each of the microchannels, wherein the compliant member urges against the housing such that a flow of fluid from the inlet passage of the housing and into the inlet plenum must pass through the opening defined by the compliant member to the inlet manifold and into the plurality of juxtaposed microchannels, wherein a portion of the compliant member occupies a portion of the recessed region defined by the second side of the housing member while leaving a portion of the recessed region defined by the second side of the housing member unoccupied to define exhaust manifold regions flanking the recessed groove and opening from end regions of the microchannels.

Amendments to the Drawings

The attached sheet of drawings includes changes to FIG. 8. This sheet replaces the corresponding original sheet of drawings.

Attachment: Replacement Sheet

Remarks

Claims 49-66, 68-73, and 75-77 are pending. In the outstanding Office Action, claims 53, 57, 62-66, 68-70 and 75-76 have been withdrawn, and each of the remaining claims stands rejected. By this amendment, claims 49, 59, 60, 71, 72, and 75-77 are amended, and no claims are presently cancelled or withdrawn. Claims 78-80 are added. Thus, following entry of this amendment claims 49-66, 68-73, and 75-80 will be pending.

Reconsideration and withdrawal of the outstanding rejections are respectfully requested in view of the amendments above and the remarks below.

Amendments to the Drawings

FIG. 9 has been amended by adding reference numeral "340" and a corresponding lead line. The amendment to FIG. 9 adds no new matter. Support for the amendment can be found in at least original FIGS. 7, 8, 9, and 10, and in the Specification, e.g., in at least the text appearing at page 24, lines 7-16 (stating "The illustrated housing 330 has a first side 340, a second side 333 positioned opposite the first side …"), and at page 24, line 21 through page 25, line 8.

The outstanding objection to the drawings should be withdrawn.

Amendments to Claims 49, 59, 60, 71 and 72

Claim 49 has been slightly amended to change the recitation "first" to the recitation "second" to conform to the terminology used in the specification and to reduce possible confusion over the use of generic terms such as "first" and "second." Corresponding amendments to claims 59, 60, 71, and 72 are made to conform to the change in claim 49. Those amendments are made without prejudice or disclaimer as they have not been made in favor of patentability.

Rejections Under 35 U.S.C. § 112

Claims 75-77 stand rejected under 35 U.S.C. § 112 for alleged indefiniteness.

Claim 75 has been amended to depend from and to conform to claim 49. Claims 76 and 77 have been amended to conform to claim 49.

The outstanding Section 112 rejections should be withdrawn.

Rejections Under 35 U.S.C. § 103

Claims 49-52, 54-56, 58-61, 71-73, and 77 stand rejected under 35 U.S.C. § 103 as allegedly being unpatentable over U.S. Patent No. 6,679,315 (Cosley) and U.S. Patent No. 4,909,305 (Nelson), as follows:

Claims 49-52, 54, 56, 58 and 77: Cosley and Nelson only;

Claim 55: Cosley, Nelson and U.S. Publication No. 2005/0205241 (Goodson);

Claims 59-61: Cosley, Nelson and U.S. Publication No. 2006/0185829 (Duan); and

Claims 71-73: Cosley, Nelson, Duan and U.S. Publication No. 2003/0085028 (Galtz).

Independent Claim 49

Cosley does not disclose "a plurality of juxtaposed fins defining a corresponding plurality of microchannels between adjacent fins," as claim 49 recits.

As a threshold matter, the outstanding rejection of independent claim 49 mischaracterizes the applied Cosley reference in fancifully alleging Cosley's fins 82 define microchannels, as well as by relying on the passage in Cosley at col. 3, lines 42-44, to support that contention. Cosley does use the term "fins" to describe the elements labeled 82 and shown and described in connection with Cosley's "evaporator 28." However, the similarity to claim 49's recitation "a plurality of juxtaposed fins defining a corresponding plurality of microchannels between adjacent fins" stops there.

Moreover, Cosley describes so-called Joule-Thomson cooling which occurs when, for example, a refrigerant rapidly expands and cools as a result of the expansion. *See*, Cosley, col. 3:60-4:43. Additionally, Cosley explains that so-called "pool-boiling occurs among the fins" in the evaporator. Id. at 4:42-43. Further, Cosley explains that the refrigerant changes to a gas phase within the evaporator. Id. at 4:44-49.

Based on Cosley's description of pool boiling and phase change in Cosley's evaporator 28, one of ordinary skill in the art would not have considered the gaps or other passageways between Cosley's fins 82 as being microchannels. One of ordinary skill in the art would have understood that liquid-to-gas phase change, particularly in a pool-boiling context, would inhibit flow of coolant through microchannel regions, leading to so-called "dry-out" in the microchannels. Such a "dry-out" condition, when it occurs, renders the cooling device

inoperable and unsuitable for its intended purpose of removing heat because when a microchannel dies out, no further coolant is available to evaporate and absorb heat. Still further, such considerations would have deterred one of ordinary skill from modifying Cosley's device by providing microchannels between Cosley's fins 82.

Moreover, the cited passage in Cosley does not overcome such deterrence. Instead of describing passageways between Cosley's fins 82, Cosley's passage at col. 3, lines 42-44, describes "capillaries" in Cosley's base 26 (alleged in the rejection to be equivalent to a claimed "compliant member"). Even if such a "capillary" could be considered as being equivalent to a "microchannel," which Applicant in no way concedes, such capillaries are associated with Cosley's base 26 and not with the "evaporator 28" or any other structure alleged to be equivalent to a claimed heat sink. In short, the described "capillaries" are utterly unrelated to any passageway between Cosley's fins 82.

Cosley's "base 26" is not equivalent to a claimed "compliant member"

Cosley's base 26 is understood to be stiff and rigid and thus cannot be considered as being equivalent to a claimed compliant member, as alleged in the outstanding Office Action. One of ordinary skill in the art would understand that the refrigerant passing through Cosley's capillaries 60 defined by the base 26 is under high pressure (e.g., based on Cosley's description of rapid expansion and associated cooling of a refrigerant). One of ordinary skill in the art would further understand that the base 26 contemplated by Cosley is rigid or stiff, since a compliant base 26 would deform under high pressure, causing system leaks and/or flow by-pass between adjacent capillaries. Further, such deformation, leaks, and/or flow by-pass would have deterred one of ordinary skill in the art from modifying Cosley's stiff and rigid base to be a compliant member, as claimed.

In contrast to Cosley's stiff and rigid member, claim 49 recites "a compliant member." Even under the "broadest reasonable interpretation" standard applicable to examination of patent applications, claim interpretation cannot be untethered from other claim terms and teachings of the specification. *See* In re Suitco Surface, Inc., 603 F.3d 1255, 1260 (Fed. Cir. 2010). Under its plain and ordinary meaning, a "compliant member" is not equivalent to a "stiff" or a "rigid" member. The outstanding Office Action cherry-picks a sentence from the Specification in this

application, without giving any weight to the context in which that sentence appears, to allege support for asserting equivalence between Cosley's stiff and rigid base 26 and a claimed compliant member. The specification explains:

> The insert body 360 can be formed using, for example, an injection molding technique, a machining technique, or other suitable process now known or hereafter developed. In a working embodiment, the body 360 is formed of a compliant polymeric material that generally conforms to and seals against adjacent surfaces. Any suitable material can be used to form the insert body 360, provided that the selected material is compatible with other components of the subassembly 300 and the selected working fluid. For example, common materials from which the insert body can be formed include silicone or any other suitably compliant material. ***[Spec., p. 28:20-29-2.]***

Cosley's stiff and rigid base 26 is not equivalent to a compliant member.

In addition to the foregoing differences between Cosley's stiff and rigid base and claimed compliant members, Cosley's base 26 does not occupy any recessed region defined by the second side of the housing, let alone urge against a corresponding wall of the recessed region, as amended claim 49 recites.

Nelson does not provide for or otherwise overcome the noted and other deficiencies of Cosley

Nelson's plate 36 is not equivalent to a claimed compliant member. Nelson's plate 36 is also understood to be stiff and rigid, in part because Nelson refers to it as a "plate" rather than another term connoting flexibility, conformability, or compliance, such as, for example, "gasket" or "seal".

Additionally, the arrangement of Nelson's device suggests the plate 36 is stiff and rigid rather than compliant. For example, in FIG. 1, the arrows indicate fluid exiting the channels 23 between the fins must turn 180 degrees to flow in the passageway 38 over the top of the plate 36. If the plate 36 was compliant, the outer edges of the plate would tend to lift from the fins under the force of the fluid flow, as the plate 36 is spaced apart from the opposed housing wall.

Moreover, Nelson does not disclose any structure that could be considered as being equivalent to a compliant member that occupies a recessed region defined by the second side of the housing, let alone one that urges against a corresponding wall of the recessed region, as amended claim 49 recites.

For the foregoing and other reasons, the applied Nelson reference does not provide for or otherwise overcome the noted and other deficiencies of the applied Cosley reference with regard to independent claim 49. Thus, even after reviewing Cosley and Nelson, one of ordinary skill in the art would not have found the combination of features recited in claim 49 to have been obvious.

The outstanding rejection of claim 49 should be withdrawn. Claim 49 should be allowed.

Dependent claims 50-52, 54, 56, 58 and 77 must be allowable by virtue of their dependency from claim 49, as well as for each independently patentable combination of features they recite

Each of dependent claims 50-52, 54, 56, 58 and 77 depends from and thus incorporates the features recited in independent claim 49. Thus, each of claims 50-52, 54, 56, 58 and 77 must be allowable over Cosley and Nelson for at least the same reasons as independent claim 49 is allowable over those references, as well as for the independently patentable combination of features each of those claims recites.

For example, claim 58, which depends from claim 50, recites that "the housing member further defines a portion of an inlet plenum, wherein the inlet plenum and the inlet manifold are together configured to convey a fluid in a direction generally transverse to the fins and thereby to distribute the fluid among the plurality of microchannels." Claim 50 recites that the compliant member and the groove defined by the heat sink fins define a portion of an inlet manifold.

In contrast to arrangements recited in claim 58, Cosley's purported inlet plenum 30 and purported inlet manifold 92 are entirely spaced apart from each other and are not cooperatively coupled with each other to convey a fluid or to distribute the fluid as claimed in claim 58. For example, Cosley's purported inlet plenum conveys fluid vertically in a direction parallel to (i.e., not transverse to) Cosley's fins 82 or cooperate with the inlet manifold 92 to turn the fluid to a transverse flow direction. And, since inlet manifolds according to claim 58 (vis-à-vis claim 50) are partially defined by the compliant member and the groove defined by the heat sink fins, Cosley's inlet manifold 92 cannot properly be considered as being equivalent to claimed inlet manifolds since Cosley does not disclose or even appreciate the desirability of any structure that could be considered as being equivalent to a groove.

And, to the extent that Nelson might be considered as describing an inlet manifold, which Applicant does not concede, Nelson does not disclose any structure that could be considered as being an inlet plenum that cooperatively conveys fluid transverse to the fins as recited in claim 58. For example, Nelson's inlet tube 30 conveys fluid downwardly in a direction parallel to the fins 22 (i.e., not "transverse" to the fins, as claimed in claim 58).

Thus, even after reviewing Cosley and Nelson, the combination of features recited in claim 58 would not have been obvious to one of ordinary skill in the art. Claim 58 therefore recites an independently patentable combination of features.

Claim 58 should be allowed.

Dependent claim 55 must be allowable by virtue of its dependency from claim 49, as well as for the independently patentable combination of features it recites

Dependent claim 55 depends from and thus incorporates the features recited in independent claim 49. As noted above, claim 49 is allowable over Cosley and Nelson. The applied Goodson reference does not provide for or otherwise overcome the noted and other deficiencies of Cosley and Nelson with regard to claim 49. Thus, claim 49 must also be patentable over Cosley, Nelson, and Goodson.

Claim 55 must also be allowable over Cosley, Nelson and Goodson for at least the same reasons as independent claim 49 is allowable over those references, as well as for the independently patentable combination of features recited in claim 55. For example, claim 55, which depends from claim 54, further specifies that claim 54's recessed region can be a tapered recessed region. According to claim 54, an aperture extends from the recessed region through the compliant member. Thus, according to claim 55, an aperture extends from a tapered recessed region through the compliant member.

In contrast to structure according to claim 55, Goodson's purportedly tapered recess 220B lacks any aperture extending from the recessed region. Rather, Goodson's etched channel 220B terminates within a substrate and does not extend through any structure that could be considered as being equivalent to a compliant member.

As the specification in this application explains, the tapered recess, aperture extending therefrom, and the recessed groove defined by the heat sink fins provide a lower pressure drop

for fluid entering the heat sink. *See*, Spec., 32:7-14. Goodson's etched channel, which terminates within a substrate would not reduce the pressure drop – rather, it would prevent flow through the substrate.

For at least the foregoing reasons, one of ordinary skill in the art would be deterred from incorporating Goodson's etched channel configuration at an inlet to a heat sink, and would not have modified Nelson and Cosley's devices to incorporate such structure from Goodson.

Thus, a review of Cosley, Nelson, and Goodson would not have led one of ordinary skill in the art to a combination of features arranged as claimed in claim 55. Accordingly, claim 55 recites an independently patentable combination of features.

Claim 55 should be allowed.

Dependent claims 59-61 must be allowable by virtue of their dependency from claim 49, as well as for each independently patentable combination of features they recite

Each of dependent claims 59-61 depends from and thus incorporates the features recited in independent claim 49. As noted above, claim 49 is allowable over Cosley and Nelson. The applied Duan reference does not provide for or otherwise overcome the noted and other deficiencies of Cosley and Nelson with regard to claim 49. Thus, claim 49 must also be patentable over Cosley, Nelson, and Duan. Moreover, each of claims 59-61 must also be allowable over Cosley, Nelson, and Duan for at least the same reasons as independent claim 49 is allowable over those references, as well as for the independently patentable combination of features each of those claims recites.

And, even assuming for the sake of argument that one of ordinary skill in the art could have modified Cosley's device according to Nelson and Duan, which Applicant does not concede, the resulting device would lack features recited in claim 59. For example, claim 59 recites that "a portion of the inlet plenum is recessed from the second side of the housing member, wherein the first side of the housing member is positioned opposite the second side, and a recess from the first side defines a pump volute, wherein the portion of the inlet plenum is positioned adjacent the pump volute." Duan discloses no structure that could possibly be considered as being equivalent to an "inlet plenum" as claimed in claim 59.

The rejection of claim 59 is unclear what structure the Office asserts to be equivalent to a claimed "inlet plenum" at least partially defined by a housing recess. But, as the Office Action is best understood, Duan's "runner 241" is asserted to be equivalent to a recessed inlet plenum according to claim 59. However, fluid does not flow from Duan's "runner 241" shown in FIG. 8 into a heat sink. Rather, as shown by the arrows in FIG. 8, coolant flows from the "impeller stage 23" through the cover 24 and into the cooling plate module 3. Thus the "runner 241" cannot be considered as a claimed inlet plenum.

Accordingly, even if a person of ordinary skill in the art could modify Cosley's device according to Nelson and Duan, such a modified device would necessarily lack an inlet plenum according to claim 59.

Thus, claim 59 recites an independently patentable combination of features in relation to Cosley, Nelson and Duan.

Claim 59 should be allowed

Among other features, claim 60 recites that "the housing member defines an opening from the substantially cylindrically-shaped portion extending generally tangentially of the cylindrically-shaped portion." Contrary to assertions in the Office Action, Duan does not disclose such a tangential opening. Rather, as shown in FIGS. 2 and 3, the passage defined by the "cut-out" portion in the cover 24 (e.g., the gap in the ring defining the runner 241) extends ***radially*** and not ***tangentially*** as claimed.

Thus, claim 60 recites an independently patentable combination of features in relation to Cosley, Nelson and Duan.

Claim 60 should be allowed

The Office Action equates Cosley's elongated recess 70 to the claimed second recess in claim 61. However, claim 61 recites that "a portion of the second recessed region at least partially defines an exhaust manifold overlying a respective portion of each of the microchannels at a position spaced from the inlet manifold." In contrast, Cosley's elongated recess 70 does not overlie any structure that could be considered as forming a portion of any microchannels (and not simply because Cosley does not disclose microchannels between fins 82). Rather, when assembled, Cosley's recess 70 merely overlies Cosley's exhaust manifold 94.

The Office has not put forth a *prima facie* case of obviousness as to claim 61. Claim 61 should be allowed.

Dependent claims 71-73 must be allowable by virtue of their dependency from claim 49, as well as for each independently patentable combination of features they recite

Each of dependent claims 71-73 depends from and thus incorporates the features recited in independent claim 49. As noted above, claim 49 is allowable over Cosley, Nelson and Duan. The applied Galtz reference does not provide for or otherwise overcome the noted and other deficiencies of Cosley, Nelson and Duan with regard to claim 49. Thus, claim 49 must also be patentable over Cosley, Nelson, Duan and Galtz. Moreover, each of claims 71-73 must also be allowable over Cosley, Nelson, Duan, and Galtz for at least the same reasons as independent claim 49 is allowable over those references, as well as for the independently patentable combination of features each of those claims recites.

Moreover, for reasons similar to those described above in connection with claim 59, Duan does not disclose a claimed cylindrically shaped recess from the first side and a second side having a recessed inlet plenum positioned radially outward of the substantially cylindrically shaped recess, as recited in claim 71. None of Cosley, Nelson and Galtz provides for or otherwise overcomes the noted and other deficiencies of Duan with regard to claim 71. Thus, claim 71 further recites an independently patentable combination of features in relation to the applied references.

Claim 71 should be allowed.

Claims 72 and 73 depend from claim 71 and must be allowable over the applied references by virtue of such dependency, as well as for the independently patentable combinations of features they recite.

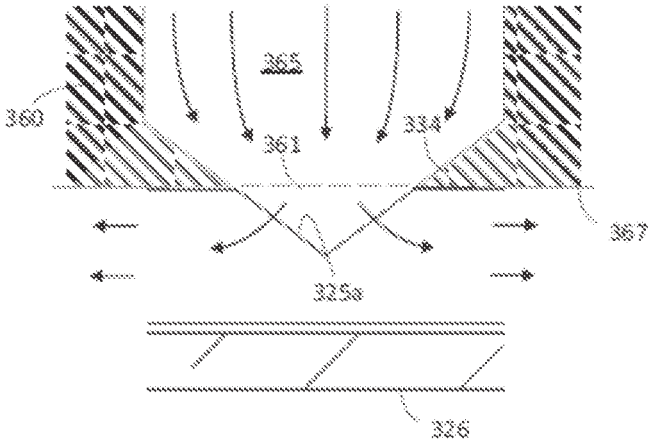
Claims 72 and 73 should be allowed.

Claims 53, 57, 62-66, 68-70 and 75-76 should be Rejoined

Each of withdrawn claims 53, 57, 62-66, 68-70 and 75-76 depends from and thus incorporates the features recited in independent claim 49. Thus, each of withdrawn claims 53, 57, 62-66, 68-70 and 75-76 must be allowable for at least the same reasons as independent claim 49 is allowable, as well as for the independently patentable combination of features each of those claims recites. Thus, claims 53, 57, 62-66, 68-70 and 75-76 should be rejoined.

And, even if claim 49 is rejected after further examination, each of claims 53, 68, and 75-76 recites features illustrated in Applicant's election, i.e., alleged sub-species CBA (FIGS. 18A, 19 and 19A), and therefore should be rejoined.

For convenience, FIG. 19 is reproduced:



As the Specification states, "FIG. 19 illustrates a cross-sectional view of a heat sink as shown in FIG. 18A with the manifold insert shown in FIG. 12 overlying the fins of the heat sink." Spec., 10:18-19.

Claim 53

Claim 53 recites: "The heat exchange system of claim 49, wherein a cross-sectional profile of the recessed groove comprises a selected one or more of the group consisting of a v-shaped notch, a semi-circle, a parabola, a hyperbola, and a notch having at least one substantially straight edge." In FIG. 19, the cross-sectional profile of the recessed groove 325a comprises "a v-shaped notch," as well as "a notch having at least one substantially straight edge." Thus, claim 53 recites features illustrated in Applicant's election of alleged sub-species CBA.

Claim 53 should be rejoined and examined concurrently with the remaining claims in this application.

Claim 68

Claim 68 recites: "The heat exchange system of claim 62, wherein each of the beveled distal edges defines a corresponding recessed portion, thereby defining the recessed groove." In

FIG. 19, each of the "distal edges defines a corresponding recessed portion 325a, thereby defining the recessed groove." Thus, claim 68 recites features illustrated in Applicant's election of alleged sub-species CBA.

Claim 68 should be rejoined and examined concurrently with the remaining claims in this application.

Claims 75 and 76

Claim 75 recites: "A fluid heat exchanger according to claim 49 wherein the recessed groove is positioned in the middle 50% of a length measured between opposed ends of the microchannels."

The Specification explains that FIG. 18A (i.e., one of the drawings forming alleged sub-species CBA) "illustrates a cross-sectional view of a heat sink having a v-shaped, transverse groove in its fins as taken along section line 18-18 in FIG. 14." Spec., p. 10:12-13. FIG. 14 clearly illustrates an embodiment according to claim 75's recitation "a recessed groove positioned in the middle 50% of a length measured between opposed ends of the [depicted] microchannels." Thus, elected FIG. 18A also illustrates an embodiment according to claim 75.

Claim 75 should be rejoined and examined concurrently with the remaining claims in this application.

As well, the Specification states: "FIG. 19 illustrates a cross-sectional view of a heat sink as shown in FIG. 18A with the manifold insert shown in FIG. 12 overlying the fins of the heat sink." Spec., p. 10:16-17. The specification explains further:

> As shown in FIG. 14, a transverse groove 325 can extend transversely relative to the fins 400. As noted above, the aperture 361 in the manifold insert 334 can generally overlie the groove 325, defining a flow transition that hydraulically couples in parallel each of the microchannels 404 to at least one other of the microchannels.
>
> FIG. 19 shows a cross-sectional view of one example of such a flow transition. The recessed region 365 defined by the insert body 360 and the recessed groove 325 together define a substantially larger characteristic length, e.g., hydraulic diameter, than the aperture 361 does alone. For example, the recessed region 365, the aperture 361 and the groove 325 can together define a flow transition having a hydraulic diameter between about 150% and about 200% larger than the corresponding hydraulic diameter of the aperture 361 alone, which can provide a substantially lower head-loss coefficient for the assembled flow transition. ***[Spec., p. 32-3-14.]***

Claim 76 (amended to conform to claim 49) recites: "A fluid heat exchanger according to claim 49 wherein the opening positioned over the groove is positioned in the middle 20% of a length measured between the opposed ends of the microchannels." Thus, elected FIG. 19 shows an embodiment according to claim 76.

Claim 76 should be rejoined and examined concurrently with the remaining claims in this application.

Applicant does not necessarily agree with any of the assertions regarding the claims withdrawn from examination in the outstanding Office Action. More particularly, Applicant's foregoing remarks regarding several withdrawn claims shall not be construed to suggest that Applicant disagrees with only the remarks in the outstanding Office Action pertaining to claims 53, 68, and 75-76. Thus, Applicant foregoing remarks concerning claims 53, 68, and 75-76 are made without prejudice or disclaimer.

New Claims 78, 79, and 80

Claims 78, 79 and 80 have been added to present new and/or alternative claimings. The addition of those claims introduces no new subject matter in this application. Each of claims 78 and 79 depends directly or indirectly from allowable claim 49, and thus must also be allowable by virtue of such dependency. Claim 80 recites a nonobvious combination of features in relation to the references presently of record.

Thus, each of new claims 78-80 should be allowed

No Disclaimer

More generally, nothing herein should be deemed as a disclaimer or surrender of any rights, acquiescence in any rejection or objection, or a waiver of any arguments that might have been raised but were not raised herein of otherwise during prosecution of this application. All rights in and to subject matter disclosed in this application are reserved including the right to claim all such subject matter in this or a related application using the same or substantially similar claims to any claims that have been presented in this application or using one or more alternative claims.

Conclusion

Accordingly, each pending claim is in condition for allowance for at least the foregoing reasons and Applicant respectfully requests that all pending rejections be withdrawn and that a Notice of Allowance be entered as to all claims.

The Commissioner is hereby authorized to charge any fees, including extension fees, or to charge any additional fees or underpayments, or to credit any overpayments, to the Credit Card account referenced and authorized via the EFS Web (Electronic Filing System). As an alternative, in case the Credit Card account cannot be processed, the Commissioner is hereby authorized to charge any fees, additional fees, or under payments, or to credit overpayment, to Deposit Account No. 50-1001.

Please contact the undersigned by telephone for any reason pertaining to the examination of this application.

Respectfully submitted,
GANZ POLLARD, LLC

Date: January 30, 2015

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